

Mongoose Models Relationship Diagram

Model	Fields	Relationships
User	<ul style="list-style-type: none">- name: string- email: string (unique)- passwordHash: string- isVerified: boolean- role: admin student supervisor- refreshTokenHash: string null	Has many Exams, Certificates
Exam	<ul style="list-style-type: none">- userId: ObjectId (ref: User)- status: enum- currentStep: enum null- step1Score, step2Score, step3Score- finalLevel: string null- dueAt: Date null	Belongs to User Has many Attempts
Attempt	<ul style="list-style-type: none">- examId: ObjectId (ref: Exam)- step: STEP_1 STEP_2 STEP_3- score, total- startedAt, submittedAt	Belongs to Exam Has many Answers May be linked to Certificate
Answer	<ul style="list-style-type: none">- attemptId: ObjectId (ref: Attempt)- questionId: ObjectId (ref: Question)- choiceId: string- correct: boolean	Belongs to Attempt Belongs to Question
Question	<ul style="list-style-type: none">- competency: string- level: A1–C2- text: string- choices[]- correctChoiceId: string	Has many Answers
Certificate	<ul style="list-style-type: none">- userId: ObjectId (ref: User)- level: string- attemptId: ObjectId (ref: Attempt)- createdAt	Belongs to User Belongs to Attempt
OTP	<ul style="list-style-type: none">- email: string- codeHash: string- expiresAt: Date- consumed: boolean- createdAt	Standalone